

## Editorial Department.

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[N an interesting article—in the November number for 1876, of the London *Lancet*,—on “the duality of the vaso-motor system” of nerves, certain views are set forth, which we believe to be erroneous, and since they relate to important questions in the physiology of the nervous system, we offer a few remarks on them. The particular point made by the writer of the article in question, is that “the doctrine of inhibition and inhibitory nerves is dying.” The writer says that the “most cursory glance over the modern tendencies of physiological research is sufficient to show this.” But what doctrine are we to hold in regard to the facts, which the hypothesis of inhibitory nervous action was devised to explain?

The writer in the *Lancet* says, that the “substitute for the doctrine of inhibition may be summed up in the phrase, the duality of the vaso-motor system.” “It considers that all the vascular nerves may be resolved into two mutually antagonistic sets,—the constrictor nerves and the dilator nerves,—the normal tonicity of an artery being due to the balance kept between these two vaso-motorial agents. If that balance be destroyed, the part supplied by the vessel becomes either hyperæmic or anæmic, according as the dilating or contracting power has the upper hand.

“Thus whereas on the theory of inhibition vascular dilatation was a passive process, a suspension of the usually operating vaso-motorial influence or state of contraction of the vessel, on the present view, there is held to be as much action about the dilatation of an artery, as there is about the narrowing of its caliber.” Various reasons are given for the rejection of the theory of inhibition, whether in relation to the vaso-motor, or

other parts of the nervous system. But to us these reasons have never seemed sufficiently cogent to warrant the conclusion reached by the writer in the *Lancet*.

Though our readers have had this question often treated in the pages of the JOURNAL, yet we do not think a re-statement of what we believe to be the correct view as to vaso-motor nervous action, will be superfluous.

Then in the first place as regards inhibitory nervous action, our author says in general, that "it is dying," and that this fact is shown by even a cursory glance over the field of modern physiological research. But what is inhibitory nervous action? It is simply the restraining action which one nervous center exerts through the medium of connecting nerve-fibres over another center, usually the weaker and more peripheral of the two. Will it be seriously denied that the action of a subordinate center cannot be controlled by the action on it of a higher one? Is any fact in nervous physiology better established? Will it be denied that a higher center can excite a lower one to action? We do not see how either position can be denied as correct. The examples of the control of a lower by a higher nervous centre are so numerous, that we deem it unnecessary to cite even one of them. So much for the general question of inhibitory action in nervous physiology.

But next as regards its application to the vaso-motor nervous system. Must we deny this form of action to that part of the nervous system, as the writer in question supposes? Let us see. The view combatted in the article in the *Lancet*, supposes the muscular arteries to be furnished with sensory or excitor nerves, which proceed from their inner coats to certain small ganglia or ganglion cells, which lie in or near the muscular walls of the vessels in question. These nerve cells are stimulated to action by the excitor nerves which convey impressions to them from the vessels. The action of the ganglion cells causes a motor impulse to pass out from them along the motor nerves which terminate in the unstriated muscular fibre of the coats of the adjacent vessels, and in this way the coats of the vessels are nominally kept in a constant state of contraction which varies greatly according to circumstances. This is what is called vascular *tonus*. The vessels always em-

brace the column of moving blood with some firmness. This we say is the so-called *tonus*. The little nervous apparatuses which we have described, constitute the local peripheral vaso-motor apparatuses. But they are not isolated and devoid of means for co-ordinating the action of various vascular areas throughout the body.

The regulating apparatus lies more deeply within the recesses of the economy, near the other great central nervous mechanisms, and they are found partly within the cord and medulla. A certain set of fibres pass out, it is supposed, which serve to connect the peripheral with the central or spinal vaso-motor apparatuses. These connecting fibres are of one kind, and they terminate peripherally, not in the muscular coats of the vessels, but in the ganglion cells of the peripheral vaso-motor apparatus. And their action on it is to *arrest* the natural action of these peripheral tonic centers. Naturally they are always in gentle action during the continuance of health. If these nerves do not act, then the reflex-tonic action of the peripheral apparatus is unrestrained, and the vessels contract to a small caliber. But if the action of the nerves which proceed from the cord is increased, they arrest in a certain degree, the tonic action of the peripheral apparatus in which they terminate, and the vessel relaxes and enlarges by reason of the expansive pressure of the contained blood. The vessel, or rather its nervous apparatus, is not paralyzed, its *tonus* is simply diminished. In this simple way do the vessels contract and expand, and hence regulate the supply of blood to a part. Is this view unreasonable or in opposition with any known facts in nervous physiology?

But we will admit the true condition of the case to be, that instead of one, there are two sets of fibres passing between the cord and the peripheral vaso-motor apparatuses, one of these exciting it to increased, and the other to diminished action. The former are called *vaso-constrictors* because their action leads to contraction of the vessels. The latter are called *vaso-dilators*, because by their action they lead to dilatation of the vessels. But what do these two sets of nerves act on peripherally? Do they act on the muscular tissue itself directly, or the peripheral vaso-motor apparatus as already

stated? All the probabilities are in favor of this latter view. But whether the two sets of nerves mentioned act directly or indirectly, on the muscular coats of the vessels, they are supposed to conflict in their action. But suppose for the time that they act on the peripheral vaso-motor apparatus in which they are supposed to terminate, how do they act?

Manifestly the vaso-constrictors act by exciting or strengthening the action of the peripheral apparatus, while the vaso-dilators must either diminish its action or arrest the action of the vaso-constrictors, but in either case the action of these last nerves is one of inhibition or arrest. But if we suppose, as hardly seems probable under the circumstances that both the vaso-constrictors and vaso-dilators terminate in the muscular coat directly, they must conflict even there in their action, by a sort of mutual inhibitory process, for they must be supposed to be in continual antagonistic action.

So in whatever way we regard the case, we can hardly escape the admission of inhibitory action, not even by the hypothesis of "duality of the vaso-motor system." As to the appearances of vermicular activity, as well as simple dilatation, which the vessels present at times, we have been led to explain them in a wholly different way to that of supposing the clumsy hypothesis of special vaso-dilator nerves; but we cannot now give the explanation, for want of space.

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The following letter speaks for itself. We insert it to add as far as it is in our power to its circulation among thinking members of the medical profession:

November 1, 1876.

**SIR:**—The Superintendents of the American Institutions for the Improvement of Idiots and Feeble-minded Children having formed an Association for the more rapid advance and spread of their special part of medical science, resolved, not only to unite their efforts, but to seek the assistance of physicians in general practice who can help them to elucidate the causes of idiocy and kindred affections.

Previously, when searching individually for these causes, we met with three obstacles: one from the parents, whose ignorance or false delicacy could not, or would not, tell the truth; second, one from our mode of pro

cedure, which was to not communicate nor put in common the findings of our individual experience; and a third, worse yet, to send abroad printed inquiries whose specifications were so worded by conceited theories as to force the answers towards biased issues, thereby rendering these data untrustworthy, if not truthless.

Now, knowing better from experience, we send you no syllabus, but we rely upon your own intelligence to write a short communication of the causes of idiocy which have come to your knowledge from reliable witnesses or personal observation.

The names will be either omitted or made use of at your request.

Please address, as soon as convenient, the Secretary of the Association, I. N. KERLIN, M.D., Superintendent of the Pennsylvania Training School for Feeble-minded Children, Media, Pa.

Members of the Association:

- DR. GEO. BROWN, Barre, Mass.
- " G. A. DOREN, Columbus, O.
- " I. N. KERLIN, Media, Pa.
- " H. M. KNIGHT, Lakeville, Conn.
- " E. SEGUIN, New York.
- " E. C. SEGUIN, New York.
- " HENRY TUCK, Boston, Mass.
- " H. B. WILBUR, Syracuse, N. Y.
- &c., &c., &c.

We have received the first number of the *Quarterly Journal of Inebriety*, a new journal published under the auspices of the American Association for the cure of inebriates. It contains besides the Proceedings of the Association and the President's Address, an article by Dr. Geo. M. Beard, on the Causes of the Increase of Inebriety in the United States. We wish this new journal, occupying as it does a very important special field, all possible success.

*The American Medical Bi-Weekly*, the successor of *The American Medical Weekly* of Louisville, has appeared and presents quite an attractive appearance.